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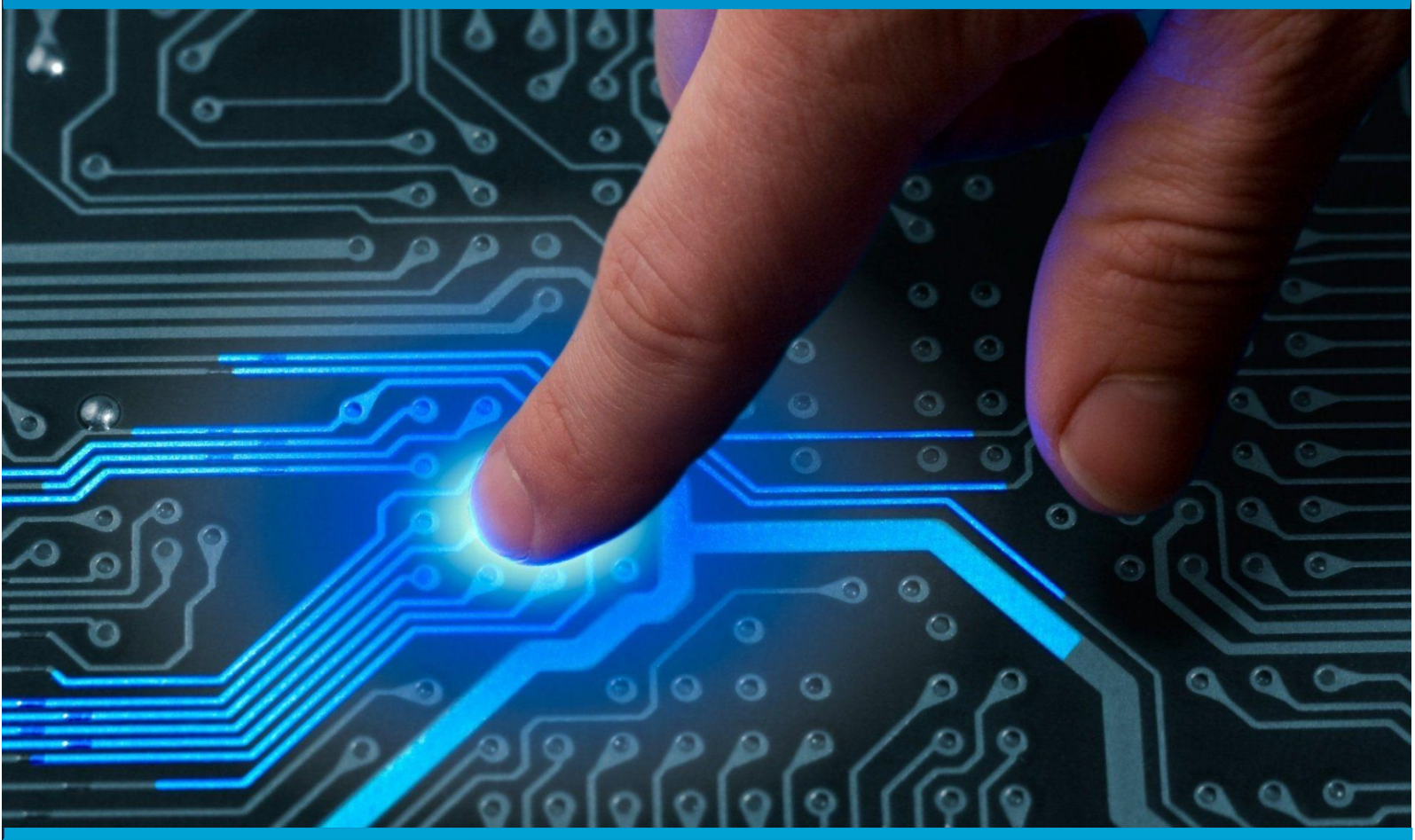

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A Survey on Big Data Analytics and Automated Attendance System in Education Sector

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ABSTRACT: The usage of learning management systems in education has been increasing in the last few years. Students have started using mobile phones, primarily smartphones that have become a part of their daily life, to access online content. Student's online activities generate an enormous amount of unused data that are wasted as traditional learning analytics are not capable of processing them. This has resulted in the penetration of Big Data technologies and tools into education, to process the large amount of data involved. This study looks into the recent applications of Big Data technologies in teaching and presents a review of literature available on Educational Data Mining and Learning Analytics. Big data is characterized from the context of volume, velocity and veracity and encompasses different challenges including analysis of data, capture and data creation, efficient storage, transfer and visualization of data along with the privacy and security of data. Big Data analytics to improve the efficiency and effectiveness of students' learning and maximize their knowledge retention. The face is the identity of a person. The methods to exploit this physical feature have seen a tremendous change since the advent of image processing techniques. The attendance is taken in every school, colleges and the library. The traditional approach for attendance is professor calls student name & record attendance.

KEYWORDS: Face Recognition, Face Detection, attendance, Big data in education, attendance with Big data

I. INTRODUCTION

The online learning and educational modules are producing server activity that is reaching to terabytes. E-learning portals or online educational systems receive many hits in a month as numbers of students are increasing day by day. Standard analytical programs are slow to meet analysis requirements; as data requirements are exploding. Thus a need to use Big Data models has been realized to accelerate the analytical procedures. Today many NoSQL platforms like Hadoop, Cassandra, MongoDB etc. There is emerged supporting MapReduce paradigm. These provide a basis for a large number of parallel computations and analysis on educational data to extract relevant patterns. Educational institutions are gaining insights from approaches based on Big Data analytics tools, to make education better amongst large heterogeneous populations of student demographics

Maintaining attendance is very important and compulsory in all the institutes for checking the performance of students. Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file-based approach, and some have adopted forms of automatic attendanceusing some biometric techniques. There are many automated methods availableforthis purpose, i.e. biometric attendance. All these methods also waste time because students have to make a queue to touch their thumb on the scanning device. Organizations of all sizes use attendance systems to record when student or employees start and stop work and the department where the work is performed. When it comes to schools and universities, the attendance monitoring system is a great help for parents and teachers both. Parents are never uninformed of the dependability of their children in the class if the university is usingan attendance monitoring system.

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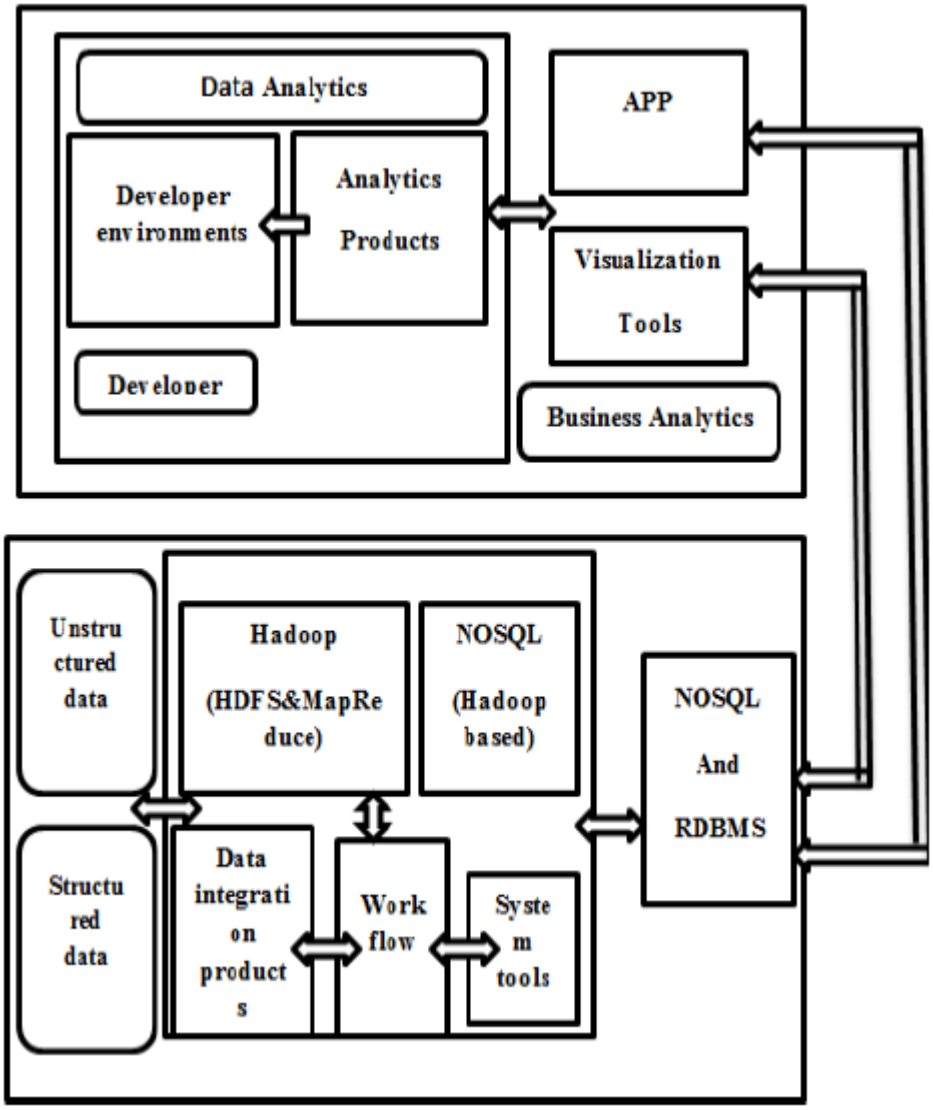

Figure I: Framework handling educational data.

II. LITERATURESURVEY

Srinidhi MB and et al. recording the attendance of the students, teachers, and other institutional staff is a very hectic job in a college environment. A web-enabled automated system for recording attendance in a college environment is proposed here. Four-tier architecture is implemented here to make the system more secure. The attendance of the students is recorded with the help of the biometric device. The system can also detect the current location of the students, faculties, and other staff members anywhere within the domain of the institution campus.

Dr Suvarna Nandyal and et al. Apply Face detection techniques such Asada-boost algorithm to detect the faces in frames/images and then features are extracted of the detected face by Histogram of Oriented Gradients (HOG) and Local Binary Pattern (LBP) algorithm.

Priya P. Sharma and et al. In Big Data Era, where data is accumulated from various sources, security is a significant concern (critical requirement) as there is no fixed source of data. With the Hadoop gaining larger acceptance within the industry, a natural concern over the security has spread. A growing need to accept and assimilate this security solution and commercial security features have surfaced. In this paper, we have tried to cover all the security solution to secure the Hadoop ecosystem.

Dr Ben Daniel Big Data can help provide insights to support student's learning needs. For instance, learning analytics as a fundamental component of Big Data in higher education provide researchers with opportunities to carry out real-time analysis of learning activities. By performing retrospective analysis of student data, predictive models can be created to examine students at risk and provide the appropriate intervention, hence enabling instructors to adapt their teaching or initiate tutoring, tailored assignments and continuous assessment.

Peter Michalik and et al. There are many software application and technologies are supporting work with Big Data. This paper describes an option of using these technologies for processing of Big Data from a technical perspective. It means that technical architecture has been designed. This architecture should be a suitable model for processing of Big Data from university´s environment.

Banica Logica and et al. The entire solution described is efficient, because activities are separated on levels and resources, the traffic is managed by Hadoop in Clouds, and the analysis is able to add graphic representations to other types of results. Considering that Big Data in the Cloud environment solutions, promoted by the biggest software companies, are performing, but also expensive, we will recommend a unified learning management system based on open-source software. Thus, the evolution of open-source products for this domain will allow universities to benefit from this new trend that empowers today's education.

Jyotsna Talreja Wassan, the Big Data paradigms, are needed in today's world to support data mining approaches for increasing the efficacy of educational institutions. The usage of Mongo DB platform for data storage and Map-Reduce paradigm for analyzing academic data is proposed in this paper. In future, the use of various Big Data platforms like Hadoop, Mongo DB, Cassandra etc. and parallel programming models like Hadoop Map Reduce, PACT etc., for different data analytics techniques could be explored to accelerate the analysis of educational data.

III. PROPOSED SYSTEM

The system consists of a camera that captures the video of the students sitting in the classroom and sends it to the administration server using the web service. For the database, the input is the image of the student, the pre-processing of the image is done, and then the features of the face are extracted using Local Binary Pattern (LBP) and Histogram of Oriented Gradients(HOG), the features are eyes, nose, and mouth, and then it is subjected to the Support Vector Machine (SVM) classifier. After all this process, the images of the student are stored in the database. In the administration server, video is processed. From the video, we generate a number of frame/images. The pre-processing of the image/frame is done and then image subjected to the Face Detection where faces from the image/frame are detected. The features of the face are to be extracted in the feature extraction module using LBP and HOG; the parts are eyes, nose, and mouth. Then the SVM training is done on the faces. Here all the faces are detected from the input image, and the algorithm compares them one by one with the face database. If the features of the face match that with the face of the database, then the attendance is marked from where anyone can access and use it for different purposes. Teachers come in the class and just press a button to start the attendance process, and the system automatically gets the attendance without even the intensions of students and teacher. In this way, a lot of time is saved, and this is highly securing process no one can mark the attendance of others. The camera takes the video continuously to detect and recognize all the students in the classroom.

Attendance will be taken using RFID technology, and attendance verification will be done by face recognition. Even though there are many technologies available for attendance taking like manual, Bluetooth, Infrared, Wi-Fi, NFC and computerize then also we select RFID technology. The main reason is all the above technology has many loop halls which will be cover by RFID. The same way there are different technologies for attendance verification then also we select Face recognition technology. The main reason is all the above technology has many loop halls which will be cover by Face Recognition. RFID has a capability of reading of several labels simultaneously automatically. They identify each product individually and can contain information like student ID. RFID does not requirea direct line of sight. RFID is having Longer Read range than other technologies. Likewise, RFID has many more advantages over other technologies. The crucial part of the technology is RFID Tags; RFID tags do not need to contain batteries, and can therefore remain usable for very long periods (maybe decades). The scanning antennas can be permanently affixed to a surface; handheld antennas are also available. They can take whatever shape you need; for example, you could build them into a door frame to accept data from persons or objects passing through.

IV. CONCLUSION

The field of education is gaining insight from large volumes and variety of real-time data known as Big Data. Educational institutions are generating vast volumes of data, from grades or test scores to admissions or enrolment

numbers. With the advent of online courses offered by many universities, the amount of data available to education officials and students has exploded. Various data mining approaches and soft analytical wares help in identifying relevant pedagogic approaches. It is multiple data analytics techniques that could be explored to accelerate the analysis of educational data. This will help in building scalable models in the field of education and may provide a better scope of improvement in the field of academic analytics.

Our proposed project, —An Automated Attendance System, has been envisioned to reduce the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and make a system that is useful to the organization, such as an institute. The camera plays a crucial role in the working of the system; hence the image quality and performance of the camera in the real-time scenario must be tested thoroughly before actual implementation.

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